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The Mineral Industry of Venezuela

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This publication is a chapter from the current Bureau of Mines Minerals Yearbook, comprising *Volume I, Metals and Minerals; Volume II, Area Reports: Domestic; Volume III, Area Reports: International.* The separate volumes of the Yearbook are sold by the Superintendent of Documents, Washington, D.C. 20402.

The Mineral Industry of Venezuela

By Harold R. Newman[1]

Even though Venezuela's economy contracted for the second consecutive year in 1984, the mineral resource sector showed increased activity. Petroleum continued to be Venezuela's major source of revenue. There was increased production of steel, aluminum, and alumina by state-owned industries. The mining sector activity increased nearly 25% over that of 1983 as a result of a significant increase in iron and steel production. Gold production increased 53% and coal production increased 30% from that of 1983; however, production of nonmetallic minerals fell 3% below that of 1983.

On the overall economic picture, Venezuela's gross domestic product declined 1.7% from that of 1983 compared with a 4.8% contraction in 1983, compared with that of 1982. The country's economic problems are a major constraint on growth. Economic adjustment measures adopted by the Government, including further devaluation of the currency, increases in local fuel prices, and a cutback in state expenditures, were expected to provide the basis for a recovery in economic activity.

Major progress was made on rescheduling the foreign debt. In September 1984, the Government and creditor bank representatives reached an agreement in principle on rescheduling about $21 billion of the total $26.4 billion debt, and at yearend, were close to agreement on a long-term schedule for repayment.

Venezuela's conscientious adherence to its Organization of Petroleum Exporting Countries (OPEC) oil production quota of 1.6 million barrels per day (bbl/d) resulted in oil exports rising only modestly in value from $13.8 billion[2] in 1983 to $14.7 billion, down from a peak of $19.1 billion in 1981. This situation continued to impact foreign exchange earnings. There was increased interest in maximizing the use of natural gas, of which Venezuela is a major world producer. The Government had plans to construct additional gas pipeline systems in order to double domestic consumption of natural gas. This would make available substantial volumes of fuel oil and diesel oil, which could then be exported without increasing crude oil production.

There was a relaxation in attitude by the Government toward foreign investment. It was recognized that foreign investment represents a vital source of external financing and that increased foreign investments would boost growth and diversify the oil-dependent economy. Reportedly, new direct foreign investment increased 16% in 1984 over that of 1983 in terms of Venezuela's currency. In dollar terms, total foreign investments were about $2.5 billion, with the United States accounting for 58% of the total.

PRODUCTION

Petroleum continued to be the major component of Venezuela's mineral production. Petroleum provided over 60% of Government revenue, accounted for 25% of the gross national product, and brought in 90% of export earnings in 1984. Petroleum production in 1984 averaged 1.86 million bbl/d including condensates and natural gas liq-

uids, which was virtually the same as 1983. Development of the Orinoco Heavy Oil Belt continues at a reduced rate, with a goal of producing 400,000 bbl/d by the end of the century. Exploration continues to emphasize searching for additional onshore light crude, but total exploration activity has declined sharply and was expected to remain around current levels as long as the world oil market is depressed. Production drilling has also dropped sharply, because production capacity of 2.55 million bbl/d significantly exceeds Venezuela's OPEC quota. About 568 production wells were reported drilled in 1984.

The aluminum industry's production continued to increase and represented the second largest source of foreign currency revenues after petroleum. The total aluminum production was 386,150 tons, which represented a 16% increase over that of 1983. Interamericana de Alúmina C.A. (INTERALUMINA) increased alumina production by 103% from 560,000 tons in 1983 to 1,139,000 tons in 1984. Domestic use of alumina by the Aluminio del Caroní S.A. (ALCASA) and Industria Venezolana de Aluminio C.A. (VENALUM) smelters accounted for 766,000 tons with the remaining 372,000 tons of alumina exported. ALCASA and VENALUM increased production and profits in 1984 because of the favorable foreign exchange rate. Both plants ran close to capacity, and a majority of the output was exported. Venezuela currently has the largest aluminum smelting capacity in Latin America.

Iron ore production increased to 12.7 million tons from 9.7 million tons in 1983. Both domestic and export sales improved, leading to projections of further growth in production; however, construction of the country's second integrated iron and steel works, the Siderzulia project, has been canceled. Although steel ingots and semimanufactures production increased 15% and 28%, respectively, in 1984, CVG Siderúrgica del Orinoco C.A. (SIDOR) was still operating well below capacity, and no major investment was contemplated in basic steelmaking capacity. Gold production was reported to be almost 51,000 troy ounces; however, the Government was still concerned that a significant portion of gold output has been smuggled out of the country.

Table 1.—Venezuela: Production of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1980	1981	1982	1983[p]	1984[e]
METALS					
Aluminum:					
Alumina	--	--	--	560,000	1,139,000
Metal, unalloyed ingot	327,900	313,523	273,633	332,000	386,150
Gold, mine output, metal content troy ounces	13,565	27,810	27,993	33,200	50,885
Iron and steel:					
Iron ore and concentrate thousand tons	16,103	r e14,929	11,200	9,715	12,723
Metal:					
Pig iron[3] do.	2,367	2,230	2,357	2,246	3,185
Ferroalloys:					
Ferromanganese do.	e2	e2	2	2	2
Ferrosilicomanganese do.	1	10	9	9	9
Ferrosilicon[3] do.	r59	44	42	46	44
Total do.	r62	56	53	57	55
Steel ingots and castings do.	r1,975	r2,030	2,296	2,558	2,940
Semimanufactures, hot-rolled do.	r1,680	r1,619	1,738	1,919	2,460
Lead, secondary, smelter[e]	10,000	10,000	10,000	10,000	8,000
NONMETALS					
Cement, hydraulic	4,843,363	4,876,253	5,431,860	4,444,104	3,648,759
Clays:[4]					
Kaolin	e22,000	65,642	65,000	11,250	43,489
Other thousand tons	e2,000	2,629	2,600	e2,600	1,688
Diamond:					
Gem carats	210,520	97,000	83,000	45,367	40,739
Industrial do.	455,336	403,000	357,000	233,553	232,183
Total do.	665,856	500,000	440,000	278,920	272,922
Feldspar	6,065	21,684	7,000	37,400	28,800
Gypsum	117,476	218,234	159,000	204,600	151,200
Lime, hydrated	--	1,888	e1,900	e2,000	--

See footnotes at end of table.

Table 1.—Venezuela: Production of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1980	1981	1982	1983[p]	1984[e]
NONMETALS —Continued					
Nitrogen: N content of ammonia	360,653	414,689	440,433	379,652	463,000
Salt, all types	243,145	394,660	455,000	310,650	NA
Stone, sand and gravel:[4]					
Stone:					
Dolomite	NA	254,540	182,000	83,000	157,420
Granite	208	1,256	1,200	770,970	431,900
Limestone thousand tons	19,074	31,690	5,760	27,302	10,847
Marble cubic meters	[e]200	292	189	169	68
Sand and gravel thousand tons	12,248	9,946	13,105	5,250	8,853
Sand, glass do.	--	[r]440	280	107	331
Sulfur, byproduct of petroleum and natural gas[5]	85,000	85,000	84,000	85,000	86,000
MINERAL FUELS AND RELATED MATERIALS					
Carbon black[6] thousand tons	23	19	18	18	51
Coal, bituminous	39,421	45,735	43,100	39,100	50,870
Gas, natural:					
Gross million cubic feet	1,251,864	1,224,586	1,163,973	1,222,100	1,150,364
Marketable do.	589,046	584,349	527,000	508,460	517,664
Natural gas liquids:[3]					
Natural gasoline thousand 42-gallon barrels	5,472	5,177	5,642	4,483	4,708
Liquefied petroleum gas do.	16,448	14,889	15,720	13,949	13,945
Total do.	[r]21,920	[r]20,066	21,362	18,432	18,653
Petroleum:					
Crude[6] do.	793,397	767,552	691,689	657,365	658,279
Refinery products:					
Gasoline:					
Aviation do.	276	284	328	430	539
Motor do.	57,557	59,578	62,694	67,500	46,100
Jet fuel do.	11,699	11,369	14,362	14,500	14,486
Kerosine do.	4,352	5,266	3,675	4,440	4,277
Distillate fuel oil do.	63,688	61,890	62,745	67,510	69,744
Residual fuel oil do.	168,906	147,117	140,052	108,740	117,466
Lubricants do.	3,277	2,741	2,481	[e]2,400	2,340
Liquefied petroleum gas do.	2,537	1,765	1,955	[e]2,000	1,868
Asphalt and bitumen do.	7,634	10,082	9,313	8,660	8,930
Naphtha do.	12,752	8,534	10,140	[e]10,000	19,800
Refinery gas[7] do.	6,497	8,518	8,578	9,200	12,020
Unspecified do.	2,292	1,870	1,479	27,260	27,813
Total do.	341,467	319,014	317,802	322,640	325,383

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available.

[1]Table includes data available through July 1, 1985.

[2]Includes sponge iron.

[3]Figure represents combined 45% silicon content and 75% silicon content production.

[4]Data prior to 1981 was based on figures taken from the Memoria y Cuenta published annually by the Ministerio de Energia y Minas. Some of this information is not compatible with 1981 figures, but will be adjusted when more reliable data become available.

[5]From nonassociated natural gas only.

[6]Includes associated natural gas lease condensate and natural gasoline. Lease condensate is included as follows, in thousand 42-gallon barrels: 1980—1,227; 1981—1,661; 1982—1,771; 1983—3,127; and 1984—not available. Natural gasoline is included as follows, in thousand 42-gallon barrels, reported: 1980—308; 1981—307; 1982—293; 1983—229; and 1984—not available.

[7]Liquid equivalent.

TRADE

Petróleos de Venezuela S.A. (PDVSA) exported about 1.5 million bbl/d of crude oil and derivatives during 1984. Export revenues were estimated to be $14.9 billion at an average price for crude and derivatives of $26.78 per barrel, PDVSA diversified its exports sales; however, the United States continued to receive nearly 43% of Venezuelan exports of crude and derivatives, either directly or indirectly. PDVSA continued to export about 60,000 bbl/d of crude to Caribbean and Central American countries on concessional terms under the San José agreement between Venezuela and Mexico.

The value of other exports, mainly aluminum and iron and steel, totaled $1.2 billion. Aluminum exports fell to 124,000 tons, down from 298,256 tons in 1983, because of suspension of exports to Japan in the last quarter of 1984. There was a dispute over contract prices, which was being negotiated at yearend. This decrease in exports was

partially offset by a rise in domestic sales from 22,000 tons in 1983 to 54,000 tons. INTERALUMINA increased its exports of alumina from 131,000 tons in 1983 to 371,000 tons in 1984, which yielded $62 million in foreign exchange earnings. Venezuela's main export market for steel products was the United States, which took about 555,000 tons, 45% of the country's total shipments. Total export sales of iron ore were 8.3 million tons, of which 1.4 million tons went to the United States.

Table 2.—Venezuela: Exports of selected mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1982	1983	Destinations, 1983	
			United States	Other (principal)
METALS				
Aluminum: Metal including alloys:				
Scrap	(2)	784	730	Japan 54.
Unwrought	228,614	298,256	40,547	Japan 192,670; Netherlands 49,709.
Semimanufactures	808	21,059	13,879	Japan 4,957; Costa Rica 824.
Copper: Metal including alloys:				
Scrap	1,308	975	525	Belgium-Luxembourg 280; Netherlands 100.
Semimanufactures	3	602	417	Italy 161; Colombia 14.
Iron and steel: Metal:				
Scrap	(2)	1,742	4	Japan 1,738.
Pig iron, cast iron, related materials	239,799	381,088	173,724	France 83,024; Italy 42,412.
Ferroalloys, ferrosilicon	43,707	67,130	32,113	Japan 32,808; Netherlands 2,209.
Steel, primary forms	115,653	103,733	12,093	Philippines 15,907; Japan 15,341; Republic of Korea 15,182.
Semimanufactures:				
Bars, rods, angles, shapes, sections	4,332	302,270	44,131	Belgium-Luxembourg 51,984; Algeria 40,216.
Universals, plates, sheets	117,892	363,799	148,001	Thailand 62,040; Japan 36,352.
Hoop and strip	880	--	--	
Rails and accessories	9	22	(2)	Mainly to Colombia.
Wire	122	1,361	180	Colombia 1,143; Canada 36.
Tubes, pipes, fittings	11,258	43,013	39,658	Colombia 2,822; Uruguay 255.
Castings and forgings, rough	76	146	59	Colombia 87.
Unspecified	53,735	55,723	--	Thailand 20,766; Taiwan 12,112; Egypt 7,655.
Magnesium: Metal including alloys, unwrought	--	100	100	
Zinc: Metal including alloys, semimanufactures kilograms	2,877	19	19	
Other:				
Ashes and residues	425	--	--	
Base metals including alloys, all forms	--	8	8	
NONMETALS				
Abrasives, n.e.s.: Natural: Corundum, emery, pumice, etc	602	(2)	--	All to Netherlands Antilles.
Asbestos, crude	8	3	--	Do.
Boron materials: Crude natural borates	230	--	--	
Cement	14	259,429	145,172	Barbados 19,234; Netherlands Antilles 13,504.
Clays, crude: Bentonite	8	--	--	
Graphite, natural kilograms	--	350	--	All to Spain.
Gypsum and plaster	8,633	--	--	
Lime	--	6	--	All to Netherlands Antilles.
Stone, sand and gravel:				
Dimension stone, crude and partly worked	467	334	--	Do.
Gravel and crushed rock	102	5,774	--	Colombia 5,740; Netherlands Antilles 17.
Quartz and quartzite	--	34	--	Italy 32; Japan 2.
Sand other than metal-bearing	2,350	1,023	--	All to Colombia.
Other:				
Crude	1	--	--	
Slag and dross, not metal-bearing	6	3	--	All to Brazil.
MINERAL FUELS AND RELATED MATERIALS				
Petroleum:				
Crude thousand 42-gallon barrels	386,134	351,276	56,648	Netherlands Antilles 122,786; West Germany 21,572.
Refinery products:				
Gasoline do.	25,185	51,830	NA	NA.
Residual fuel oil do.	110,230	93,440	60,955	Netherlands Antilles 6,935.
Unspecified do.	42,705	42,340	NA	NA.

NA Not available.
[1]Table prepared by W. L. Zajac.
[2]Less tha 1/2 unit.

Table 3.—Venezuela: Imports of selected mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
METALS				
Aluminum:				
Ore and concentrate thousand tons	67	1,719	88	Brazil 832; Guyana 409; Sierra Leone 75.
Metal including alloys:				
Scrap	(2)	1	1	
Unwrought	924	342	51	Canada 150; Peru 90.
Semimanufactures	23,425	14,455	5,689	Belgium-Luxembourg 3,134; West Germany 1,840.
Antimony: Metal including alloys, all forms	544	38	4	Bolivia 28; Japan 6.
Arsenic: Ore and concentrate kilograms	15	--		
Beryllium: Metal including alloys, all forms do	51	--		
Bismuth: Metal including alloys, all forms do	69	--		
Cadmium: Metal including alloys, all forms	2	1	1	
Chromium:				
Ore and concentrate	11,000	3,914	(2)	Philippines 3,910; France 4.
Metal including alloys, all forms	8	1	1	
Columbium and tantalum: Metal including alloys, all forms, tantalum kilograms	4	10	10	
Copper: Metal including alloys:				
Unwrought	2,940	2,249	32	Peru 1,917; India 250; Chile 50.
Semimanufactures	20,648	12,738	4,697	Belgium-Luxembourg 1,625; Canada 1,564.
Indium: Metal including alloys, all forms kilograms	3,133	141	106	Peru 35.
Iron and steel:				
Iron ore and concentrate, including roasted pyrite	5,823	11	10	West Germany 1.
Metal:				
Scrap	20,491	18,581	18,081	Netherlands Antilles 500.
Pig iron, cast iron, related materials	3,188	1,779	909	Brazil 398; Peru 150.
Ferroalloys:				
Ferrochromium	47	36	11	Sweden 20; West Germany 3.
Ferromanganese	19,059	20,430	(2)	France 15,000; unspecified 5,000.
Ferromolybdenum	1	2	1	Netherlands 1.
Ferronickel	--	2	2	
Ferrosilicomanganese	2,420	3	--	All from West Germany.
Ferrosilicon	20	26	18	Italy 8.
Ferrovanadium	110	442	347	West Germany 94.
Unspecified	391	423	182	Brazil 123; United Kingdom 75.
Steel, primary forms	119,100	3,462	2	West Germany 1,374; Italy 1,288; Japan 598.
Semimanufactures:				
Bars, rods, angles, shapes, sections	91,230	23,969	832	Japan 5,515; West Germany 5,265; Netherlands 4,054.
Universals, plates, sheets	255,862	83,547	4,796	Japan 46,761; France 12,243; West Germany 9,202.
Hoop and strip	3,610	1,428	571	Brazil 312; Japan 193.
Rails and accessories	3,571	7,120	395	France 5,217; West Germany 903.
Wire	2,124	864	23	Brazil 401; France 308.
Tubes, pipes, fittings	466,550	108,289	23,424	Japan 21,733; Italy 18,225.
Castings and forgings, rough	626	229	79	Italy 46; France 42.
Unspecified	51,261	27,815	1,734	Japan 17,170; France 1,750.
Lead: Metal including alloys:				
Unwrought	6,080	5,233	(2)	Peru 5,232.
Semimanufactures	3,247	1,910	58	Peru 1,654; West Germany 162.
Magnesium: Metal including alloys:				
Unwrought	506	228	--	Norway 125; Mexico 59; West Germany 43.
Semimanufactures	4	5	5	
Manganese: Ore and concentrate, metallurgical-grade	54,436	5,150	--	All from Mexico.
Molybdenum: Metal including alloys, all forms kilograms	1,915	296	189	Italy 101; United Kingdom 6.
Nickel:				
Ore and concentrate	3	2,663	(2)	Mexico 2,500; Australia 145.
Metal including alloys:				
Scrap	--	6	1	Canada 5.
Unwrought	185	109	46	Canada 46; Norway 10.
Semimanufactures	178	107	86	West Germany 18.

See footnotes at end of table.

Table 3.—Venezuela: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
METALS —Continued				
Tin: Metal including alloys:				
Unwrought	216	257	216	Bolivia 29; Brazil 11.
Semimanufactures	458	209	145	United Kingdom 61; France 1.
Tungsten: Metal including alloys, all forms	4	13	12	Italy 1.
Zinc: Metal including alloys:				
Unwrought	15,300	9,672	955	Peru 6,457; Canada 2,201.
Semimanufactures	983	217	150	West Germany 21; Norway 21.
Other:				
Ores and concentrates	467	26,863	35	Mexico 15,350; Panama 6,000; Brazil 5,003.
Ashes and residues	40	(2)	NA	NA.
Base metals including alloys, all forms	237	131	110	United Kingdom 21.
NONMETALS				
Abrasives, n.e.s.: Natural: Corundum, emery, pumice, etc	236	157	88	West Germany 37; Italy 15.
Asbestos, crude	7,354	4,734	568	Canada 3,715; Brazil 402.
Barite and witherite	146,025	62,266	33	Peru 33,238; Taiwan 15,748; Ireland 7,000.
Boron materials: Crude natural borates	88	241	116	Italy 79; Netherlands 40.
Cement	603,308	34,016	2,367	Cuba 14,440; Colombia 8,324; Denmark 6,049.
Chalk	2,607	353	--	Colombia 261; Belgium-Luxembourg 80.
Clays, crude:				
Bentonite	31,804	20,662	20,450	Colombia 170.
Kaolin	24,757	6,612	6,310	Italy 79; Colombia 67.
Unspecified	10,441	1,551	1,337	France 186; Spain 15.
Cryolite and chiolite	7	5,156	(2)	Denmark 5,152; West Germany 2.
Diatomite and other infusorial earth	7,719	7,150	6,875	Mexico 247; Portugal 25.
Feldspar, fluorspar, related materials:				
Feldspar	1,205	545	415	Finland 124; West Germany 5.
Fluorspar	200	155	81	West Germany 52; Mexico 19.
Unspecified	56	(2)	(2)	
Graphite, natural	737	594	344	Netherlands 180; Hong Kong 51.
Gypsum and plaster	78,704	35,140	250	West Germany 24,554; Spain 10,000.
Lime	67	68	61	Colombia 7.
Magnesium compounds:				
Magnesite	238	27	23	France 4.
Oxides and hydroxides	342	11,914	33	Austria 8,400; Mexico 3,481.
Mica: Crude including splittings and waste	1,969	656	580	France 55; West Germany 10.
Phosphates, crude	74,898	34,463	(2)	Colombia 301; unspecified 34,160.
Pigments, mineral: Natural, crude	192	15	9	Netherlands 3; United Kingdom 2.
Pyrite, unroasted	89	17	17	
Salt and brine	96	49	7	West Germany 37; Mexico 5.
Stone, sand and gravel:				
Dimension stone, crude and partly worked	7,208	3,323	32	Italy 2,855; Uruguay 128.
Dolomite, chiefly refractory-grade	59,595	35,723	35,723	
Gravel and crushed rock	456	113	2	France 100; Brazil 10.
Quartz and quartzite	23	96	(2)	France 85; Belgium-Luxembourg 10.
Sand other than metal-bearing	895	486	463	Italy 17; West Germany 5.
Sulfur: Elemental, crude including native and byproduct	168	126	126	
Talc, steatite, soapstone, pyrophyllite	9,438	5,156	3,378	Brazil 732; China 305.
Vermiculite, perlite, chlorite	304	61	47	Spain 8; Mexico 5.
Other:				
Crude	1,271	338	195	Australia 101; Canada 18.
Slag and dross, not metal-bearing	9	24	1	West Germany 23.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural	558	NA		
Carbon: Gas carbon	9	NA		
Coal:				
Anthracite	4,880	NA		
Bituminous	33,287	NA		
Briquets of anthracite and bituminous coal	8	NA		
Lignite including briquets	809	NA		
Coke and semicoke	70,152	NA		
Peat including briquets and litter	52	NA		

See footnotes at end of table.

Table 3.—Venezuela: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS —Continued				
Petroleum:				
Crude 42-gallon barrels	1,175	NA		
Refinery products:				
Liquefied petroleum gas do	455	NA		
Gasoline do	125,041	NA		
Naphtha and white spirits do	66,332	NA		
Mineral jelly and wax do	31,707	NA		
Kerosine and jet fuel do	452	NA		
Distillate fuel oil do	1	NA		
Lubricants do	18,544	NA		
Nonlubricating oils do	27,672	NA		
Residual fuel oil do	83	NA		
Bitumen and other residues do	319,544	NA		
Petroleum coke do	427,409	NA		

NA Not available.
[1]Table prepared by W. L. Zajac.
[2]Less than 1/2 unit.

COMMODITY REVIEW

METALS

Aluminum.—Both VENALUM and ALCASA primary smelters ran close to capacity in 1984. Installed aluminum reduction capacity in Venezuela is 400,000 tons per year. Both plants have expansion plans. ALCASA was intending to add a new production line with a capacity of 84,000 tons per year and to modernize its existing potlines, providing an additional 12,000 tons per year of output. VENALUM announced it would increase its smelting capacity by 70,000 tons per year with the addition of a fifth potline, raising the plants present 280,000-ton-per-year capacity to 350,000 tons per year. ALCASA was proceeding with contracting for the expansion of its rolling facilities to enable the hot rolling of 60,000 tons per year of can stock and 8,000 tons per year of alloys using a continuous casting process.

Alumina.—Alumina production at INTERALUMINA rose to 1.1 million tons in 1984, exceeding the company's goal by 14%. About 67% of production went to supply the needs of ALCASA and VENALUM, with the remaining exported to the United States and Norway. INTERALUMINA considered buying Martin Marietta Corp.'s 630,000-ton-per-year alumina refinery in St. Croix, Virgin Islands. This was in anticipation of the increased demand from Venezuela's aluminum industry; however, preliminary studies indicated the takeover was not an economical move, and negotiations were terminated. The company was in the process of installing additional bauxite processing equipment for the bauxite ore expected to start coming from the Los Pijiguaos project in 1986.

Bauxite.—CVG Bauxita de Venezolana C.A. (BAUXIVEN) awarded two civil works contracts relating to its Los Pijiguaos bauxite mining project. The contracts cover access roads and a 52-kilometer railroad to a port on the Orinoco River. The project, in Bolivar State about 500 kilometers south of Caracas, contains an estimated 200 million tons of bauxite with an alumina content of 49.5%. Initial production of 1 million tons per year was scheduled to begin in the last quarter of 1986. The project was scheduled to be completed in the final quarter of 1987 when output capacity would rise to 3 million tons per year. The open pit mine has been divided into nine blocks of ore. Mining will commence on block 1, block 2, and one-half of block 3. These blocks were estimated to contain a 20-year supply of bauxite. Completion of the project was expected to save the Government $140 million per year in foreign exchange for bauxite imports and result in a 15% reduction in production costs for INTERALUMINA, Venezuela's alumina smelter. With the startup

of the mine, Venezuela's aluminum industry, the country's second most important foreign exchange earner after petroleum, will be fully integrated. Also in the planning stages at Los Pijiguaos was a 6.5-kilometer conveyor system to move the bauxite ore from the mine to the railroad, infrastructure for a town of 2,000 people, and a bauxite ore crushing plant. The Government was planning to invest $400 million in the project over the next 2 years.

Iron Ore.—There was a significant increase in production of iron ore by CVG Ferrominera Orinoco C.A. (FERROMINERA) in 1984. An estimated 12.7 million tons was produced in 1984 compared with 9.7 million tons in 1983. Export sales also showed a gain to 8.4 million tons, of which 1.4 million tons was shipped to the United States and the remainder to Europe. FERROMINERA was continuing development of the San Isidro iron ore deposit. A 16-kilometer railway was constructed to connect with the main Cerro Bolivar-Puerto Ordaz line. The San Isidro deposit sits alongside the Cerro Bolivar Mine. Development of the San Isidro deposit, which contains an estimated 400 million tons of 65% iron ore, will further improve the competiveness of FERROMINERA. There will not be an increase in overall iron ore capacity. Production from San Isidro will replace a portion of production from Cerro Bolivar. A major part of the 2.3-million-ton-per-year output would be purchased by SIDOR. At yearend, $20 million had been expended in development costs. By 1987, the San Isidro Mine was expected to be producing 5 million tons per year.

Iron and Steel.—After a serious recession in 1983, the Venezuelan steel market showed encouraging signs of a recovery in 1984. Apparent consumption grew almost 42% over that of 1983, which had declined 48% from that of 1982. SIDOR was still operating well below capacity with no major investment contemplated in basic steelmaking capacity; however, expansion of the tube sector was planned. Conduven C.A. was reported to have substantially increased exports of tubes and pipes from 30,000 tons in 1983 to about 120,000 tons in 1984. Exports accounted for about 60% of Conduven's shipments. The United States was Conduven's main foreign market.

Other Metals.—Gold production rose significantly in 1984 owing to new developments in the Amazonas region. However, the Government, which strictly controls the domestic gold market, considers smuggling to be a major problem. Gold was thought to be smuggled out of the country and sold to dealers in Brazil and Colombia, who were reportedly paying a large premium over the Government-established gold price. The Government announced the discovery of a large titaniferous deposit on the coast at Yaracury, 250 kilometers from Caracas.

MINERAL FUELS

Coal.—Carbones del Zulia C.A. (CARBOZULIA) was continuing the development of the Guasare Coalfield in the State of Zulia, approximately 100 kilometers northwest of Maracaibo. The 6-million-ton-per-year open pit project was originally intended to supply coal to a planned 5-million-ton-per-year steel mill and a 2,000-megawatt thermal powerplant. Both of these projects have been indefinitely postponed. The coalfield has proven reserves of 160 million tons and probable reserves of 3 billion tons. CARBOZULIA was developing the project in terms of export potential. The Japanese company Idemitsu Kosan held discussions with CARBOZULIA about developing the project. In Anzontegui State in eastern Venezuela, Venezolana de Cementos C.A. (VENCEMOS) and Compañía Auxiliar de Valaduras S.A. (CAVOSA) established a private sector company, VENCEMOS-CAVOSA (Cavoven), to develop an open pit coal mine southeast of Boca de Uchire in an area thought to contain some 80 million tons of coal. The project, known as Fila Maestra, would be developed to produce coal for export. Cavoven has a 22-year contract with the Government granting it the right to mine up to 40 million tons of coal over the course of the contract.

Petroleum and Natural Gas.—Venezuela's proven crude oil and condensate reserves rose to 26.7 billion barrels by mid-1984. At the current production level of 1.8 million bbl/d, this is enough for about 40 years of production. The proven category consists of reserves that can be produced with present technology and infrastructure. PDVSA announced that the 1979-83 Orinoco Heavy Oil Belt project involving 1,223 wells and investment of $1.3 billion has demonstrated the existence of 1,200 billion barrels of oil in place, of which 250 billion barrels may be recoverable. A second 5-year program has been initiated that will concentrate on production, refining, and transport of the extra heavy crudes. PDVSA signed a bilateral technical cooperation agreement with the Federal Republic of

Germany in 1978 designed to focus on development and upgrading extra heavy crude oil. This agreement was renewed in November 1984 for 4 years. Venezuela's crude oil production capacity was 2,554 million bbl/d and was expected to stay at the same level over the next several years.

In 1984, PDVSA completed a refinery upgrading program that involved the investment of $1.1 billion over the 1977-83 period.

Venezuela's proven natural gas reserves have been growing steadily from 48.21 trillion cubic feet in 1981 to 55.37 trillion cubic feet at the beginning of 1984. Present production capacity is about 4,150 million cubic feet per day, virtually all of which is in association with crude oil.

Corpoven S.A. was proceeding with the Nurgas project, which is divided into two stages. The first involves construction of a 600-kilometer line from the central gas gathering station in Anaco westward to Morón, site of the El Centro electricity plant. The first stage is designed to minimize foreign exchange costs and maximize stimulations of domestic industry. Substantial volumes of gas would be moved in order to make available fuel oil and diesel for export. The second stage consists of a 150-kilometer pipeline from Morón to Río Seco to connect up with Lagoven S.A.'s existing line to the Amuay refinery.

Construction of the Oriente Cryogenic project, an 800-million-cubic-foot-per-day extraction plant, was almost complete at yearend, and startup was scheduled for mid-1985. Most of Venezuela's gas production is "wet" or "rich," which means it contains a high volume of carbon compounds that can be condensed into liquid form; therefore, liquid extraction will become increasingly important both as a source of high-value liquid products not subject to the OPEC crude oil production ceiling and as a necessary stage in producing dry gas for domestic consumption.

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[1]Physical scientist, Division of International Minerals.

[2]Where necessary, unless otherwise specified, values have been converted from Venezuelan bolivars (Bs) to U.S. dollars at the rate of Bs7.5 = US$1.00.

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